Preliminary Data Report for Stormwater Runoff Samples Collected in Water Canyon at State Route 4 on 7/29/00

A precipitation event occurred over the southern and eastern part of the Pajarito Plateau on the evening of July 29, 2000. A total of 0.37 inches of rain was recorded at the TA-49 meteorological station between 6:00 and 6:30 pm; 0.1 inch of rain was recorded at the TA-6 meteorological station, and 0.4 inches was recorded at the TA-54 meteorological station. Figure 1 shows the pattern of precipitation that was recorded across the Pajarito Plateau on July 29, 2000. Figure 2 shows the hydrograph of the streamflow measured at gage GS E265 in Water Canyon at State Route 4.

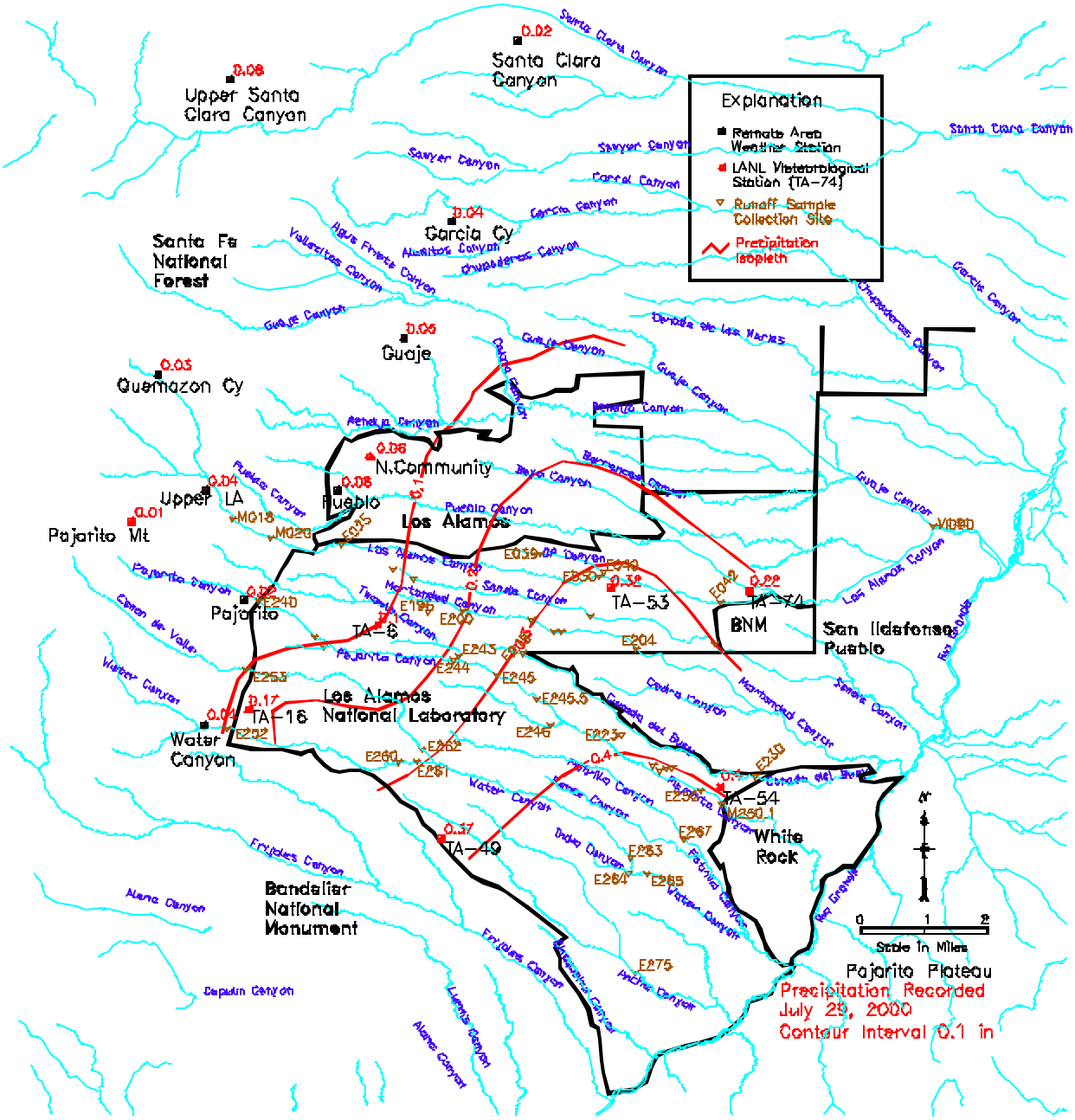


Figure 1. Isopleth of precipitation recorded on the Pajarito Plateau on July 29, 2000

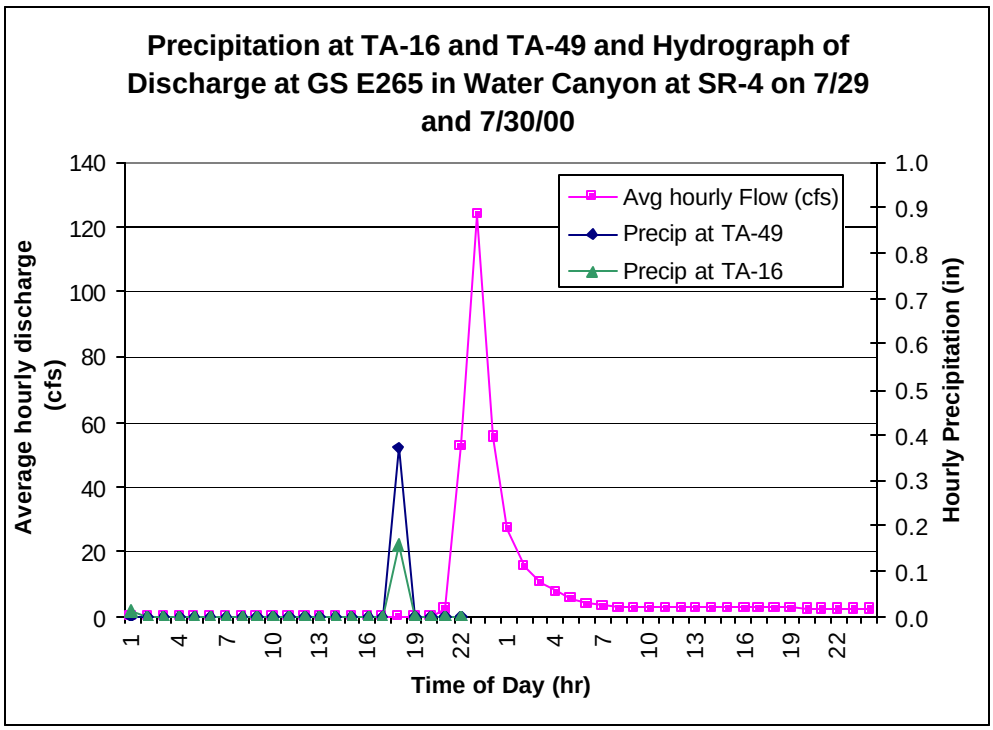


Figure 2. Precipitation at TA-16 and TA-49 and Hydrograph of streamflow at gage E265 in Water Canyon at State Route 4 on July 29 and 30, 2000

Automated stormwater runoff samples were collected at stream gage GS E265 during the runoff event. Both filtered and unfiltered samples were collected for analysis. The samples were sent to General Engineering Laboratories, Inc. in Charleston, South Carolina for analysis for radionuclides, metals, general inorganic constituents, SVOCs, PCBs, and HE compounds. Preliminary results of the available analyses are shown in Table 1. Also shown on Table 1 are the maximum values of constituents that have been recorded previous to the Cerro Grande Fire in filtered and unfiltered stormwater runoff at LANL (1995 through 1999), and the DOE Public Dose Derived Concentration Guides (DCGs), for comparison purposes. Results of gamma spectroscopy are reported for Cs-137 and radionuclides that were detected in concentrations above the detection limit.

The preliminary results of the analyses for radionuclides in the stormwater runoff samples collected on July 29, 2000 are below the historic pre-fire maximum values and are well below the DOE DCGs for each analyte obtained to date.

The unfiltered runoff sample collected on July 29, 2000 contained 21,300 mg/L total suspended solids (TSS). Based on this sediment concentration and the activity of the unfiltered water and the filtered water, the concentrations of the radionuclides in the suspended sediment fraction of the runoff samples were calculated. These calculated values are also shown on Table 1.

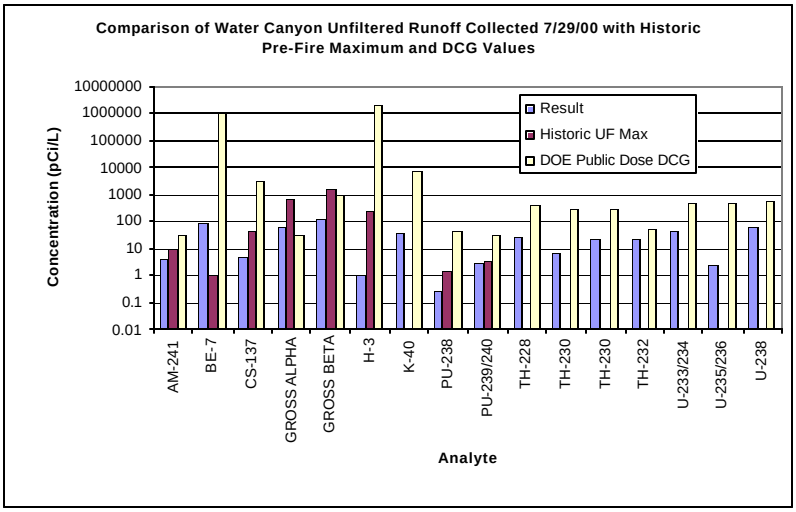
The background values (BVs) that have been determined for stream sediments at Los Alamos National Laboratory (Ryti et al. 1998) are also shown on Table 1. The BVs for stream sediments are provided as a comparison for the results of the calculated activities of radionuclides in the suspended sediment fraction of the runoff samples. Suspended sediments in runoff samples are typically finer grained than stream sediment samples; radionuclides have been found to be preferentially located in finer grained sediments, so direct comparison of the suspended sediment fraction of runoff samples with stream sediment BVs may not be appropriate, but are provided here for reference and comparison.

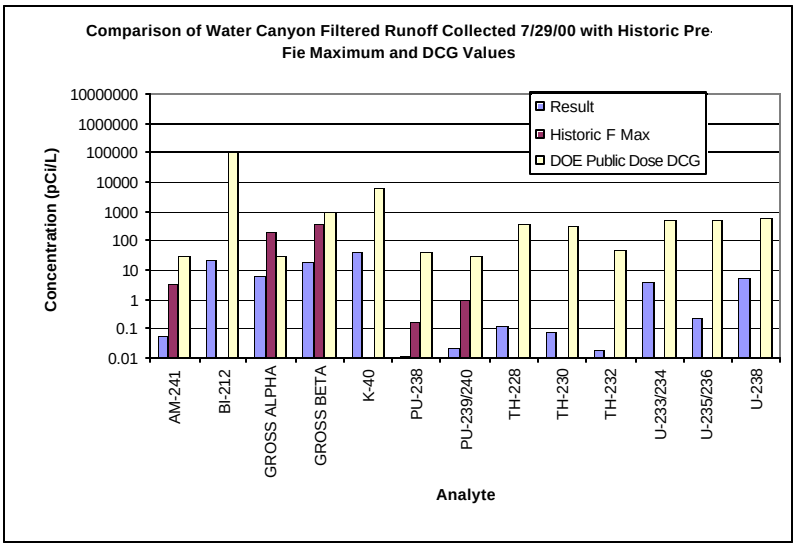
A summary of the preliminary results of the analyses is shown in Figure 3. The results are compared with the historic maximum values obtained for filtered and unfiltered runoff and the DOE DCGs. The preliminary results of the analyses for radionuclides in the stormwater runoff samples collected on July 29, 2000 are below historic maximum values and DOE DCGs for the unfiltered and filtered stormwater runoff samples.

The calculated suspended sediment concentrations with comparison to the BVs for sediments are also shown in Figure 2. Most calculated values are below the BVs except americium-241, plutonium-238, plutonium-239/240, and uranium-238, which are above the BVs for sediment. This may be the result of the finer grained materials (silt and clays) in suspension in the runoff having a higher concentration of radionuclides than stream sediments.

References

Ryti, R. T., P. A. Longmire, D. E. Broxton, S. L. Reneau, and E. V. McDonald, September 1998, "Inorganic and Radionuclide Background Data for Soils, Sediments and Bandelier Tuff at Los Alamos National Laboratory," Los Alamos National Laboratory Report LA-UR-98-4847. (Ryti et al. 1998, 59730)





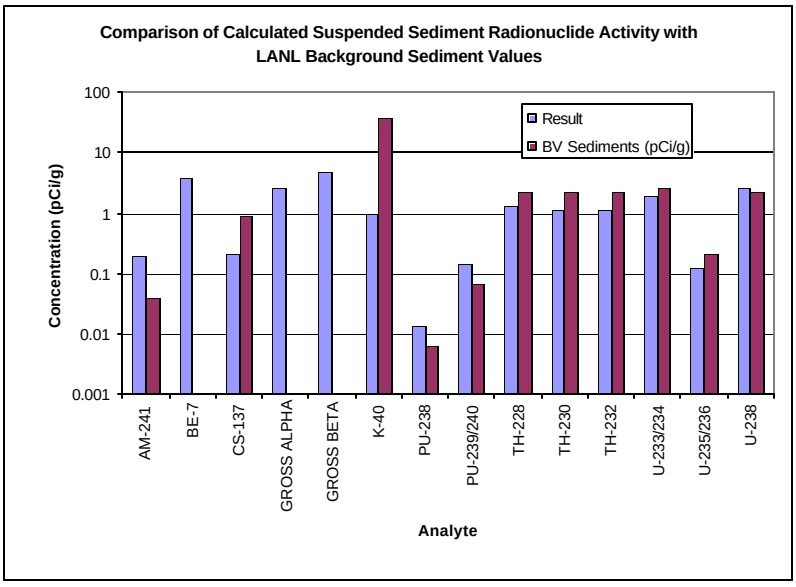


Figure 3. Comparison of Water Canyon runoff collected 7/29/00 with 1995-1999 Historic Maximum and DCG Values